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***Developmental Engineering***

**AFMC CORE CRITERIA FOR CRITICAL  
ENGINEERING POSITIONS**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This instruction establishes minimum core criteria for use in selecting personnel for critical engineering positions and for evaluating incumbents in these positions. This is the initial publication of this instruction.

**1. Purpose.** AFMC is committed to ensuring the personnel assigned to product or logistics critical engineering positions have the knowledge, experience, and professionalism to serve in their capacities and perform their duties in the highest interest of the Air Force. To help accomplish this purpose, these instructions establish the core criteria to be used by the selecting authority in the selection process of civilian service assignments or the immediate reviewer/supervisor for military and contract technical staff in the selection process. This instruction does not apply to civilian Senior Executive Service (SES), Senior Level (SL), and Scientific and Professional (ST) positions, general officer positions, or equivalent contractor positions and does not supplant any existing regulation or policy.

**2. Applicability.**

**2.1. Position Codes.** This instruction is mandatory for positions with the following duty title codes on the Unit Manpower Document (UMD):

**806 – Lead Engineer**--Engineer responsible for a single end item, or family of end items; has Operational Safety, Suitability, and Effectiveness (OSS&E) responsibility; responsible for all end item/commodity technical activities, including engineering and configuration changes.

**805 – Chief Engineer**--Senior engineer/technical authority for a weapon system or equivalent product; has OSS&E responsibility.

**807 – Director of Engineering (DOE)**--Senior engineer/technical authority responsible for multiple chief or lead engineering positions; ensures programs under their purview are addressing OSS&E; ensures Chief and Lead Engineers assigned to systems/end items within their organization are execut-

ing their responsibilities appropriately; fulfills Chief Engineer responsibilities for systems/end items without an assigned Chief Engineer.

**356 – Technical Director**--Senior engineer; technical specialty position for engineering; provides expertise on technical aspects supporting directorate or wing operation & processes; has various levels of OSS&E responsibility.

These duty titles are intended to convey engineering leadership responsibility within the scope of the assignment, regardless of whether the individual assigned is military, civilian, or a contractor.

**2.2. Position Types.** This instruction applies to civilian, military, and contractor (e.g., Federally Funded Research and Development Center contractor, Advisory and Assistance Services (A&AS) contractor, or any A&AS-like contractor) positions with the UMD codes listed in paragraph [2.1](#).

**2.3. Grade Levels and Ranks.** This instruction applies to civilian positions at GS-15 and equivalent and below, military positions at the rank of colonel and below, and equivalent contractor positions.

### 3. Responsibilities and Authorities.

3.1. AFMC Center-level Directors, Engineering (EN) have the responsibility and authority to implement this instruction at their Centers.

3.1.1. Vacant Positions. Center ENs will ensure persons serving on positions described in paragraph [2](#). meet the core criteria of [Attachment 1](#), in accordance with paragraph [4.1](#).

3.1.2. Encumbered Positions. Upon issuance of this instruction, Center ENs will review the people encumbering the positions described in paragraph [2](#). to determine if they meet the core criteria of [Attachment 1](#). For any discrepancies found, Center ENs will work with the individuals ('companies' in the case of contractors, through the contracting officer) to bring them in compliance with [Attachment 1](#) criteria, in accordance with paragraph [4.2](#).

3.1.3. Course lists. Center ENs will maintain lists of courses that provide knowledge level competency for the criteria listed in [Attachment 1](#). In order to provide knowledge level competency, a course must adequately cover the process or processes, the tools available, and the possible metrics for the competency.

3.1.4. Final authority. Center ENs are the final authority in determining whether an individual or candidate meets the criteria of [Attachment 1](#) or in determining what additional actions are needed to meet the criteria of [Attachment 1](#).

3.2. **Selecting authorities** in the selection process of civilian assignments or the **immediate reviewers/supervisors** for military and contract technical staff are responsible for following the requirements of this instruction, with Center EN guidance, when selecting personnel for positions as defined in paragraph [2](#).

### 4. Procedures.

4.1. Vacant Positions.

4.1.1. General. Upon receiving, through an appropriate source, a list of candidates for a position covered by this instruction (see paragraph [2](#).), the selecting authority in the selection process of civilian service assignments or the immediate reviewer/supervisor for military and contract technical staff will initiate an internal review of the candidates in accordance with the criteria of this

instruction. The approved candidate list may include civilian promotion, reassignment, and/or change to lower grade candidates or military or contractor reassignment candidates. For civilians, the recruitment sources are not limited to internal candidates. As appropriate to the situation, the candidate list shall be provided through normal personnel procedures or by local management procedures when only management reassignments are being considered. To pare the list of candidates for further screening, management will subsequently review the candidate listing IAW procedures set forth in this instruction. Further evaluations of the resulting pared list will be in accordance with established personnel, contracting, and local procedures. In the case of contracted technical support, Center ENs will ensure there are processes that assure contractor fills for these positions meet the core criteria.

4.1.2. Criteria. In selecting government personnel, the selecting authority in the selection process of civilian service assignments or the immediate reviewer/supervisor for military and contract technical staff will evaluate each candidate against the criteria in **Attachment 1**. Candidates meeting all of the criteria in **Attachment 1** will be considered as passing the initial screen and approved for further consideration. If there are insufficient candidates meeting all of the criteria in **Attachment 1** for adequate competition, as determined by local procedures, the selecting authority or official will select from the same approved candidate list those coming closest to meeting the **Attachment 1** criteria for further evaluation. All candidates selected must be capable of meeting all **Attachment 1** criteria within 18 months of selection for the position. If there are no candidates capable of meeting **Attachment 1** criteria within 18 months of selection for the position, the selecting authority in the selection process of civilian service assignments or the immediate reviewer/supervisor for military and contract technical staff will seek to extend the area of consideration to obtain a larger candidate pool.

4.1.2.1. Personnel selected for technical leadership positions, as defined in paragraph 2., will meet the criteria in **Attachment 1** within 18 months of selection for the position, or management will reassign them to a position not covered by this instruction.

4.1.2.2. Additional Criteria. Center ENs may add other job-related criteria to the **Attachment 1** criteria.

4.1.2.3. Program Phase. Some of the criteria in **Attachment 1** vary depending on whether the program is primarily in development or modification or in sustainment phases. Programs in the development or modification phase either have not transitioned to sustainment or have transitioned to sustainment but have major modification efforts ongoing. Programs in the sustainment phase have transitioned to sustainment and have no major modification efforts ongoing.

4.1.2.4. KSA Levels. The Knowledge, Skill, and Ability (KSA) criteria are expressed in terms of these KSA levels:

**Knowledge** = Academic/OJT understanding of the subject matter with ability to process, translate, and interpret this knowledge.

**Skill** = Skill in application of knowledge, ideas, concepts, principles, theories, and techniques in varied situations.

**Ability** = Ability to apply concepts, synthesize, and make decisions based on the overall "system" characteristics--i.e., systems engineering focus of a decision.

4.1.2.4.1. Individual Competencies. [Attachment 2](#) provides guidance and clarification for evaluating KSA criteria. It lists individual commonly recognized competencies and shows how these competencies normally apply to each of the KSA criteria.

4.1.2.4.2. Relation to Acquisition Professional Development Program (APDP) Certification. Knowledge-level competency for individual KSAs can be inferred from certification levels in various APDP stalls as indicated in [Attachment 3](#). This chart relates certification levels in various APDP stalls to assumed knowledge-level competency for individual KSAs.

4.2. **Encumbered Positions.** Government personnel encumbering positions covered by this instruction (see paragraph [2.](#)) will meet the criteria in [Attachment 1](#) within 18 months of issuance of this instruction, or management will reassign them to a position not covered by this instruction. In the case of contracted technical support, Center ENs will work through the contracting officer to reach agreements with the companies involved that assure contractor personnel encumbering positions covered by this instruction (see paragraph [2.](#)) meet the criteria in [Attachment 1](#).

**5. Waivers.** HQ AFMC/EN may grant waivers to this instruction. Center ENs shall submit waiver requests with justifications in writing to HQAFMC/EN.

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## Attachment 1

## CRITICAL ENGINEERING POSITION CORE CRITERIA

Figure A1.1. Critical Engineering Position Core Criteria.

	Description	Lead Engineer	Chief Engineer	Director of Engineering (DOE)	Technical Director
UMD Code		806	805	807	356
Experience				Displays leadership in field and depth/ breadth of understanding	Displays leadership in field and depth/ breadth of understanding
				Experience in managing engineering resources across all technical disciplines.	Shows breadth and depth of experience in engineering specialty
			Prior product technical management experience	Prior product technical management experience	
Education		BS (Technical)	BS (Technical)	BS (Technical)	BS (Technical)
- - Development/Mod Programs				Applicable Master's Degree (Technical or Business)	Applicable Master's Degree (Technical)

Figure A1.2. Critical Engineering Position Core Criteria (Continuation).

	Description	Lead Engineer	Chief Engineer	Director of Engineering (DOE)	Technical Director
- - Sustainment Programs				Applicable Master's Degree (Technical or Business)	Applicable Master's Degree (Technical or Business)
Certifications					
- APDP*		Level required for the position	Level required for the position	Level required for the position	Level required for the position
Knowledge, Skills, and Abilities**					
- Engineering Specialty	Recognized technical expert in a functional specialty, with experience in making critical, and technologically relevant decisions.				
- - Primary area		Ability	Ability	Ability	Ability
- - Other areas		Knowledge	Knowledge with increasing breadth	Knowledge with increasing breadth	Knowledge with increasing breadth

Figure A1.3. Critical Engineering Position Core Criteria (Continuation).

	Description	Lead Engineer	Chief Engineer	Director of Engineering (DOE)	Technical Director
- Systems Engineering	Understanding of the interdisciplinary approach encompassing the entire set of scientific, technical, and managerial efforts needed to evolve, verify, deploy (or field), and support an integrated and life-cycle balanced set of system solutions that satisfy customer needs. Focuses on an iterative, disciplined method which includes requirements analysis, requirements allocation, design synthesis, and technical management processes in a new capabilities-based construct. Have the ability to understand how systems engineering is applied to the joint arena.	Skill	Ability	Ability	Ability
- Test and Evaluation	Skills used to test and evaluate each system within a weapon system including the planning, monitoring, conducting and evaluating of sub-system and system level test. Analyze, assess and evaluate test data and results with the ability to prepare written assessments on the findings in a new capabilities-based construct. Have the ability to understand how test and evaluation is applied to the joint arena.	Skill	Ability	Ability	Skill



Figure A1.4. Critical Engineering Position Core Criteria (Continuation).

	Description	Lead Engineer	Chief Engineer	Director of Engineering (DOE)	Technical Director
- Capability-Based Requirements/Customer Needs	Focus on system requirements as derived from a capabilities-based assessment, such as the Capability Review and Risk Assessment (CRRA) process, (utilizing tools such as modeling, simulation, <i>etc.</i> ). Customer-centric consideration in concert with most viable solution to achieve capability-based results.	Knowledge	Skill	Ability	Skill
- System Development	Understanding of the relevant issues within system development. Functional disciplines necessary to execute a technically superior program include attention to varied activities (which may include, but not limited to system integration, system level architecture, manufacturing, quality assurance, product certification, system safety, human factors and environmental issues, <i>etc.</i> ).				
- - Development/Mod Programs		Skill	Ability	Ability	Ability
- - Sustainment Programs		Knowledge	Skill	Skill	Skill



Figure A1.5. Critical Engineering Position Core Criteria (Continuation).

- Sustainment	Understanding the role of sustainment within the system lifecycle. This key competency focuses on utilizing integrated products and processes (including but not limited to engineering support requests, mishap reporting/accident investigation, tech insertion, work specs, <i>etc.</i> ) in the development, supportability and product support of Air Force systems.				
- - Development/Mod Programs		Knowledge	Skill	Skill	Skill
- - Sustainment Programs		Skill	Ability	Ability	Ability
- Acquisition	Understanding and applying acquisition strategies in the conceptualization, initiation, design, development, test, contracting, production, deployment, logistic support, modification, sustainment and disposal of weapons and other systems, supplies or services. Includes understanding the process of planning, organizing, monitoring, overseeing and performing engineering activities relating to the development and/or modification of a system and recognition of the need to establish and implement acquisition engineering objectives, policies and specification guidelines necessary for a robust system design.	Skill	Ability	Ability	Skill

Figure A1.6. Critical Engineering Position Core Criteria (Continuation).

- Program Management	Skills/Processes used to manage and develop a system level product. (May include skills and tools that manage resources and outcomes such as Earned Value Management System, Integrated Master Plans, Integrated Master Schedules, <i>etc.</i> )	Knowledge	Skill	Skill	Knowledge
- Leadership	Skills that focus on leadership and management (leading change, leading people, results driven, business acumen, building coalitions). Models organizational improvements and technological innovations through new programs/processes.	Skill	Skill	Ability	Ability

\* In cases where key engineering positions are filled by FFRDC employees, the FFRDC in conjunction with the Center EN will designate and approve the criteria for APDP equivalency.

\*\* Knowledge = Academic/OJT understanding of the subject matter with ability to process, translate, and interpret this knowledge

Skill = Skill in application of knowledge, ideas, concepts, principles, theories, and techniques in varied situations

Ability = Ability to apply concepts, synthesize, and make decisions based on the overall "system" characteristics--*i.e.*, systems engineering focus of a decision

## Attachment 2

**CRITICAL ENGINEERING POSITION CORE CRITERIA KNOWLEDGE, SKILL, AND ABILITY (KSA) COMPETENCIES**  
**Figure A2.1. Key Engineering Position Minimum Criteria Knowledge, Skill and Ability (KSA) Competencies.**

	Knowledge, Skill, and Ability Area								
Competency	- Engineering Specialty*	- Systems Engineering	- Test and Evaluation	- Capability-Based Requirements/ Customer Needs	- System Development	- Sustainment	- Acquisition	- Program Management	- Leadership
- - Building Coalitions									X
- - Business Acumen									X
- - Configuration Management		X			X	X		X	
- - - Data Management		X	X		X	X		X	
- - - Interface Management		X	X		X	X		X	
- - Contracting Process/Management			X			X	X	X	
- - Cost Estimating		X		X	X		X	X	
- - Earned Value Management		X			X		X	X	
- - Effective Communication Skills								X	X
- - Engineering Discipline Awareness		X	X	X	X			X	
- - Engineering Support						X			

Figure A2.2. Key Engineering Position Minimum Criteria Knowledge, Skill and Ability (KSA) Competencies (Continuation).

	Knowledge, Skill, and Ability Area								
Competency	- Engineering Specialty*	- Systems Engineering	- Test and Evaluation	- Capability-Based Requirements/ Customer Needs	- System Development	- Sustainment	- Acquisition	- Program Management	- Leadership
Requests									
- - Environmental Issues		X	X	X	X	X	X	X	
- - Familiarity with Military, International, & Industry Specifications & Standards (e.g., MIL, ISO, IEEE, ANSI)		X		X	X		X	X	
- - Financial Management						X	X	X	
- - Hardware/ Software Design Methodolgy		X	X		X				
- - Human Factors		X			X				
- - Independent Technical Review Leadership		X	X		X			X	X
- - Integration		X	X	X	X	X	X	X	
- - Integrity Programs		X			X	X			
- - Leading an IPT		X	X	X	X	X	X	X	X
- - Leading Change		X							X
- - Leading People		X						X	X
- - Logistics Management		X	X	X	X	X			
- - Manufacturing/QA		X	X		X	X	X	X	

Figure A2.3. Key Engineering Position Minimum Criteria Knowledge, Skill and Ability (KSA) Competencies (Continuation).

Competency	Knowledge, Skill, and Ability Area								
	- Engineering Specialty*	- Systems Engineering	- Test and Evaluation	- Capability-Based Requirements/ Customer Needs	- System Development	- Sustainment	- Acquisition	- Program Management	- Leadership
- - Mishap Reporting/ Accident Investigation		X	X	X	X	X			
- - Modeling, Simulation, and Performance Analysis		X		X	X				
- - Modification Management				X		X	X	X	
- - ORM		X		X			X	X	
- - POM Process & Execution							X	X	
- - Process Engineering		X	X			X	X	X	
- - Producibility		X			X		X		
- - Product Certification		X	X	X	X	X	X	X	
- - Project Planning		X		X		X	X	X	
- - Reliability & Maintainability		X	X	X	X	X		X	
- - Requirements Management		X	X	X	X	X	X	X	
- - Results Driven				X					X
- - Risk Management		X	X	X	X	X	X	X	
- - System Interoperability		X		X	X				

Figure A2.4. Key Engineering Position Minimum Criteria Knowledge, Skill and Ability (KSA) Competencies (Continuation).

	Knowledge, Skill, and Ability Area								
Competency	- Engineering Specialty*	- Systems Engineering	- Test and Evaluation	- Capability-Based Requirements/ Customer Needs	- System Development	- Sustainment	- Acquisition	- Program Management	- Leadership
- - Systems Architecture		X		X	X		X		
- - System Safety		X	X	X	X	X		X	
- - Technical Performance Measures		X	X	X	X		X	X	
- - Technical Reviews & Audits		X	X		X	X	X	X	
- - Technology Insertion		X	X	X	X	X	X	X	
- - Trade-Off Studies		X		X	X		X	X	
- - Work Specs						X			

\* The position description determines the competencies for Engineering Specialty.

### Attachment 3

#### KNOWLEDGE LEVEL COMPETENCY VS APDP CERTIFICATION

Figure A3.1. Knowledge Level Competency vs APDP Certification.

STALL	Information Technology	Life Cycle Logistics		Program Management	Systems Planning, Research, Development and Engineering		Test and Evaluation
Sub-Stall		Acquisition Logistics	Sustainment		Science and Technology Manager	System Engineering	
Level	II	II	II	II	III	II	II
Knowledge, Skills and Abilities							
- Engineering Speciality							
- Systems Engineering					X	X	
Test and Evaluation							X
- Capability-Based Requirements/ Customer Needs							
- System Development						X	
- Sustainment		X	X				
- Acquisition	X	X	X	X		X	
- Program Management				X			
- Leadership							